REVISED SCOPE OF WORK SUMMARY MATRIX
SITE INVESTIGATION AND REMOVAL ACTION

GULFCO MARINE MAINTENANCE SUPERFUND SITE

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
Soil	1. Biased Samples from Potential Source Areas (PSAs) (20 locations, 2 sample depths per location). 2. Random Samples (10 locations north of Marlin, 10 locations south of Marlin, 2 sample depths per location.) 3. Samples analyzed for VOCs (deeper sample only), SVOCs, PCBs, pesticides, metals, TPH. 4. QA/QC samples	1. North of Marlin – compare soil concentrations to lowest of: $^{GW}Soil_{Class3}$ PCL, $^{Tot}Soil_{Comb}$ PCL, EPA Reg. 6 Soil Screening Criteria (SSC), TCEQ Eco Benchmarks for soil, and EPA Eco Soil Screening Levels (SSL). 2. South of Marlin – compare soil concentrations to lowest of $^{GW}Soil_{Class3}$ PCL, $^{Tot}Soil_{Comb}$ PCL, and EPA Reg. 6 SSC. 3. Preliminary screening criteria comparisons subject to	1. Exceedence of screening criteria: collect additional samples to assess extent (lateral or vertical) from point of exceedence; and/or collect background samples to demonstrate values within background. 2. Exceedence of Eco screening criteria only: perform Tier 2/3 eco-risk assessment; collect additional samples to assess extent (lateral or vertical) from point of exceedence; and/or collect background samples to demonstrate values within background. 3. Contingent samples to include samples from property SW of Site if needed to define lateral extent. 4. Contingent samples analyzed for specific	1. North of Marlin – 200 ft. grid (28 locations, 2 samples per location). 2. South of Marlin – 100 ft. grid (85 locations, 2 samples per location). 3. Biased Samples (20 locations, 2 samples per location). 4. Background samples (2 locations, 6 samples per location). 5. Property SW of site – 100 ft. grid (20 locations, 1 sample per location). 6. Samples analyzed for VOCs (deeper sample only), SVOCs, PCBs, pesticides, metals, TPH. 7. QA/QC samples collected at EPA-requested frequency. 8. Soil bulk property samples (3 North of Marlin, 3 South of Marlin) for bulk density, pH, porosity. 9. Additional soils samples potentially	1. TX Health and Safety Code 361.604-608: requires submittal of VCP application, and execution of VCP agreement detailing technical standards for investigation and clean-up. 2. 30 TAC 333.8: requires addressing all environmental media exceeding PCLs. 3. 30 TAC 350.51: requires assessment be conducted in manner most likely to detect presence and distribution of COCs considering nature of release, requires definition of lateral and vertical extent to residential assessment level or critical PCL (on-site soils). 4. TRRP-12 (*Affected Property Assessment Requirements*): describes procedures for determining assessment

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
	collected at EPA-requested frequency. 5. Soil bulk property samples (3 North of Marlin, 3 South of Marlin) for bulk density, pH, porosity, fraction organic carbon.	adjustment based on background concentrations (i.e., values below background not considered exceedences).	COCs exceeding screening criteria (will likely vary by sample location).	required based on screening criteria exceedences.	level, defining affected property (direct comparison to assessment levels), conducting assessment (manner most likely to detect presence and distribution of COCs), and sampling strategy (site-specific depending on nature and location of release, characteristics of COCs, geology and hydrogeology of area). 5. TRRP-13 (*Review and Reporting COC Concentration Data*) provides procedures for evaluating/ reporting data quality. 6. TRRP-25 (*Critical PCLs*) provides procedures for identifying the critical PCL for each media. 7. RG-263 (*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*) provides ecological benchmarks and procedures for Tier 2 and Tier 3 Ecological Risk Assessments.
Groundwater	1. Installation of 7 monitoring wells near PSAs (3 on	1. Evaluate presence of DNAPL based on field	1. Presence of DNAPL indicated: sample DNAPL. 2. Presence of DNAPL	1. Installation of 7 monitoring wells near PSAs (3 on south site perimeter adjacent to	1. TX Health and Safety Code 361.604-608: requires submittal of VCP application, and

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
	south site perimeter adjacent to Intracoastal Waterway, 1 on north site perimeter near wetlands). 2. Examination/ field screening of soil cores for DNAPL. 3. Completion of monitoring wells to base of uppermost water-bearing unit, DNAPL check using interface probe, conductivity probe and bailer. 4. Two initial water level measurement/ DNAPL evaluation events to assess groundwater flow direction (includes monitoring of staff gages to be installed at Intracoastal	screening methods or detection in well by interface probe, conductivity probe or bailer. 2. Compare groundwater concentrations to lowest of $^{GW}GW_{Class3}$ PCL, $^{Air}GW_{Inh\text{-}V}$ PCL, and TCEQ Eco Benchmarks for water. 3. Preliminary screening criteria comparisons subject to adjustment based on background concentrations (i.e., values below background not considered exceedences).	indicated: define lateral extent of DNAPL in affected water-bearing unit. (A combination of direct push methods and/or auger drilled soil borings/ monitoring wells may be used in this effort). The lateral extent of DNAPL will be defined by the absence of any field screening indications or absence of detectable DNAPL in well. 3. Presence of DNAPL indicated: define vertical extent of DNAPL, by advancing deeper borings (using direct push or auger methods) outside the perimeter of the identified DNAPL zone to the base of the next underlying water-bearing unit, or within DNAPL zone if surface isolation casing used and competent underlying confining unite identified. 4. Presence of DNAPL indicated in underlying water-bearing unit: Repeat Steps 1 and 2	Intracoastal Waterway, 1 on north site perimeter near wetlands). 2. Examination/ field screening of soil cores for DNAPL. 3. Completion of monitoring wells to base of uppermost water-bearing unit, DNAPL check using interface probe, conductivity probe and bailer. 4. Two initial water level measurement/ DNAPL evaluation events to assess groundwater flow direction (includes monitoring of staff gages at Intracoastal Water Way and wetlands). 5. Collection of groundwater samples from monitoring wells and from direct push locations on 200 ft. grid (40 samples). 6. Samples analyzed for VOCs, SVOCs, PCBs, pesticides, metals, TPH. 7. 8 soil borings advanced 75-100 ft from impoundment perimeter to evaluate	execution of VCP agreement detailing technical standards for investigation and clean-up. 2. 30 TAC 333.8: requires addressing all environmental media exceeding PCLs. 3. 30 TAC 350.51: requires definition of lateral extent to residential assessment level, requires vertical definition to residential assessment level or demonstration that vertical migration not possible. 4. TRRP-12 (*Affected Property Assessment Requirements*): describes procedures for determining assessment level, defining affected property (direct comparison to assessment levels), conducting assessment (manner most likely to detect presence and distribution of COCs), and sampling strategy (site-specific depending on nature and location of release, characteristics of

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
	Water Way and wetlands). 5. Two initial groundwater monitoring events with sample analyses for VOCs, SVOCs, PCBs, pesticides, metals, TPH. (one sample north of Marlin and one sample south of Marlin also analyzed for TDS, major anions, cations). 6. QA/QC samples collected at EPA-requested frequency. 7. Hydraulic testing on 3 representative wells.		as needed to define the lateral extent of DNAPL in this unit and the vertical extent of DNAPL below this unit. 5. Exceedence of screening criteria: collect additional samples to assess extent (lateral or vertical) from point of exceedence; and/or collect background samples to demonstrate values within background. Vertical extent delineation will require collection of samples from next underlying water-bearing unit or demonstration that vertical migration not possible. 6. Exceedence of Eco screening criteria only: perform Tier 2/3 eco-risk assessment; calculate eco-based ^{SW}GW PCL (per TRRP procedures); collect additional samples to assess extent (lateral or vertical) from point of exceedence; and/or collect background samples to demonstrate values	potential DNAPL presence. 8. Soil boring advanced to top of water supply aquifer to characterize geology/ hydrogeology to this unit (projected depth approximately 275 feet). 9. Additional groundwater samples potentially required based on screening criteria exceedences.	COCs, geology and hydrogeology of area). 5. TRRP-13 (*Review and Reporting COC Concentration Data*) provides procedures for evaluating/ reporting data quality. 6. TRRP-25 (*Critical PCLs*) provides procedures for identifying the critical PCL for each media, including consideration of cross-media pathways. 7. RG-263 (*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*) provides ecological benchmarks and procedures for Tier 2 and Tier 3 Ecological Risk Assessments. 8. TRRP-24 (*Determining PCLs for Surface Water and Sediment*) provides procedures for evaluating groundwater to surface water and groundwater to sediment pathways and approach for calculating ^{SW}GW PCL.

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
			within background. 7. Contingent samples analyzed for specific COCs exceeding screening criteria (will likely vary by sample location).		
Surface Water	1. Collection of samples from 5 locations in wetlands north of Site (surface water locations on drainage pathways in closest proximity to former impoundments and Fresh Water Pond). 2. Collection of 3 samples from each of 2 ponds on Lot 55. 3. Samples analyzed for VOCs, SVOCs, PCBs, pesticides, metals, hardness, pH, and TDS. Metals analyses	1. Wetlands - compare surface water concentrations to lowest of TCEQ water quality standards, and TCEQ Eco Benchmarks for water. 2. Preliminary screening criteria comparisons subject to adjustment based on background concentrations (i.e., values below background not considered exceedences).	1. Wetlands - Exceedence of screening criteria: perform Tier 2/3 eco-risk assessment; collect additional samples to assess lateral extent from point of exceedence; and/or collect background samples to demonstrate values within background. 2. Contingent samples analyzed for specific COCs exceeding screening criteria (will likely vary by sample location).	1. Collection of 15 samples from wetlands north of Site. 2. Collection of 3 samples from each of 2 ponds on Lot 55. 3. Samples analyzed for VOCs, SVOCs, PCBs, pesticides, metals, hardness, pH, and TDS. Metals analyses performed on both filtered and unfiltered samples. 4. QA/QC samples collected at EPA-requested frequency.	1. TX Health and Safety Code 361.604-608: requires submittal of VCP application, and execution of VCP agreement detailing technical standards for investigation and clean-up. 2. 30 TAC 333.8: requires addressing all environmental media exceeding PCLs. 3. 30 TAC 350.51: requires definition of lateral extent to residential assessment level. 4. TRRP-12 (*Affected Property Assessment Requirements*): describes procedures for determining assessment level, defining affected property (direct comparison to assessment levels), conducting assessment (manner most likely to detect presence and distribution of COCs), and sampling strategy

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
	performed on both filtered and unfiltered samples. 4. QA/QC samples collected at EPA-requested frequency.				(site-specific depending on nature and location of release, characteristics of COCs). 5. TRRP-13 (*Review and Reporting COC Concentration Data*) provides procedures for evaluating/ reporting data quality. 6. RG-263 (*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*) provides ecological benchmarks and procedures for Tier 2 and Tier 3 Ecological Risk Assessments. 7. TRRP-24 (*Determining PCLs for Surface Water and Sediment*) provides procedures for developing surface water PCLs.
Sediment	1. Collection of samples from 5 locations in wetlands north of Site from depth of 0 to 0.5 ft. (locations on drainage pathways in closest proximity to former	1. Wetlands - compare sediment concentrations to lowest of: $^{Tot}Sed_{Comb}$ PCL, and TCEQ Eco Benchmarks for sediment. 2. Preliminary screening criteria comparisons	1. Wetlands – Exceedence of screening criteria: collect additional samples to assess lateral and vertical extent from point of exceedence; and/or collect background samples to demonstrate values within background. 2. Wetlands -	1. Collection of 15 samples from wetlands north of Site from depth of 0 to 0.5 ft. 2. Collection of 16 samples from Barge Slips/Intracoastal Waterway from depth of 0 to 0.5 ft. 3. Collection of 5 samples from large pond and 3 samples	1. TX Health and Safety Code 361.604-608: requires submittal of VCP application, and execution of VCP agreement detailing technical standards for investigation and clean-up. 2. 30 TAC 333.8: requires addressing all environmental media exceeding PCLs.

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
	impoundments and Fresh Water Pond). 2. Collection of samples from 16 locations in Barge Slips/Intracoastal Waterway from depth of 0 to 0.5 ft. 3. Collection of 5 samples from large pond and 3 samples from small pond on Lot 55 from depth of 0 to 0.5 ft. 4. Samples analyzed for VOCs, SVOCs, PCBs, pesticides, metals, TPH, grain-size and TOC. 5. QA/QC samples collected at EPA-requested frequency.	subject to adjustment based on background concentrations (i.e., values below background not considered exceedences).	Exceedence of Eco screening criteria only: perform Tier 2/3 eco-risk assessment; collect additional samples to assess lateral and vertical extent from point of exceedence; and/or collect background samples to demonstrate values within background. 3. Contingent samples analyzed for specific COCs exceeding screening criteria (will likely vary by sample location).	from small pond on Lot 55 from depth of 0 to 0.5 ft. 4. Collection of 4 samples from residential canals from depth of 0 to 0.5 ft. 5. Samples analyzed for VOCs, SVOCs, PCBs, pesticides, metals, TPH, grain-size and TOC. 6. QA/QC samples collected at EPA-requested frequency. 7. Additional sediment samples potentially required based on screening criteria exceedences.	3. 30 TAC 350.51: requires definition of lateral extent to residential assessment level. 4. TRRP-12 (*Affected Property Assessment Requirements*): describes procedures for determining assessment level, defining affected property (direct comparison to assessment levels), conducting assessment (manner most likely to detect presence and distribution of COCs), and sampling strategy (site-specific depending on nature and location of release, characteristics of COCs). 5. TRRP-13 (*Review and Reporting COC Concentration Data*) provides procedures for evaluating/ reporting data quality. 6. RG-263 (Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas) provides ecological benchmarks and procedures for Tier 2 and Tier 3 Ecological Risk Assessments. 7. TRRP-24 (Determining

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
					PCLs for Surface Water and Sediment) provides procedures for developing sediment PCLs.
Sediment Toxicity	None	1. Wetlands and Barge Slips/ Intracoastal Waterway - compare sediment concentrations to TCEQ Eco Benchmarks for sediment. 2. If Tier 3 eco-risk assessment is necessary, develop work plan for additional sampling, which may include sediment toxicity testing, as appropriate and as per TCEQ and EPA guidance.	1. Work plan to be developed for EPA review and approval if sediment toxicity testing is proposed.	1. Sediment toxicity testing to be performed if sediment data exceed screening criteria and a Tier 3 ecological risk assessment is performed. Work plan for sediment toxicity testing to be submitted for EPA review and approval.	1. 30 TAC 350.77: specifies procedures for development of eco PCLs and performance of ecological risk assessment. 2. RG-263 (*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*) provides ecological benchmarks and procedures for Tier 2 and Tier 3 Ecological Risk Assessments.
Fish/Crab Samples (Human Health)	1. Development of ^{Fish}Sed PCLs for sediment bioaccumulative COCs detected above	1. Barge Slips/ Intracoastal Waterway - compare sediment concentrations to ^{Fish}Sed PCLs.	1. Fish/crab sampling work plan to be developed for EPA review and approval if ^{Fish}Sed PCLs exceeded on statistical basis.	1. Fish/crab sampling to be performed following collection of initial sediment samples. Details of sampling program to be proposed in work plan to be submitted for	1. TRRP-24 (Determining PCLs for Surface Water and Sediment) provides procedures for calculating ^{Fish}Sed PCLs.

SOW Component	Proposed Initial Phase Activities	Proposed Decision Process	Follow-up/ Contingent Phase Activities	EPA Requested Activities	Key VCP/ TRRP Requirements/ Guidance
	background in sediment samples.			EPA review and approval.	
Biological Tissue Testing (Ecological)	None	1. Wetlands and Barge Slips/ Intracoastal Waterway - compare sediment concentrations to TCEQ Eco Benchmarks for sediment. 2. If Tier 3 eco-risk assessment is necessary, develop work plan for additional sampling, which may biological tissue testing, as appropriate and as per TCEQ and EPA guidance.	1. Work plan to be developed for EPA review and approval if biological tissue testing (ecological) is proposed.	1. Biological tissue testing (ecological) to be performed if sediment data exceed screening criteria and a Tier 3 ecological risk assessment is performed. Work plan for biological testing to be submitted for EPA review and approval.	1. 30 TAC 350.77: specifies procedures for development of eco PCLs and performance of ecological risk assessment. 2. RG-263 (*Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*) provides ecological benchmarks and procedures for Tier 2 and Tier 3 Ecological Risk Assessments.